

Soldiers On Point for the Nation



Army Transformation

Persuasive in Peace, Invincible in War

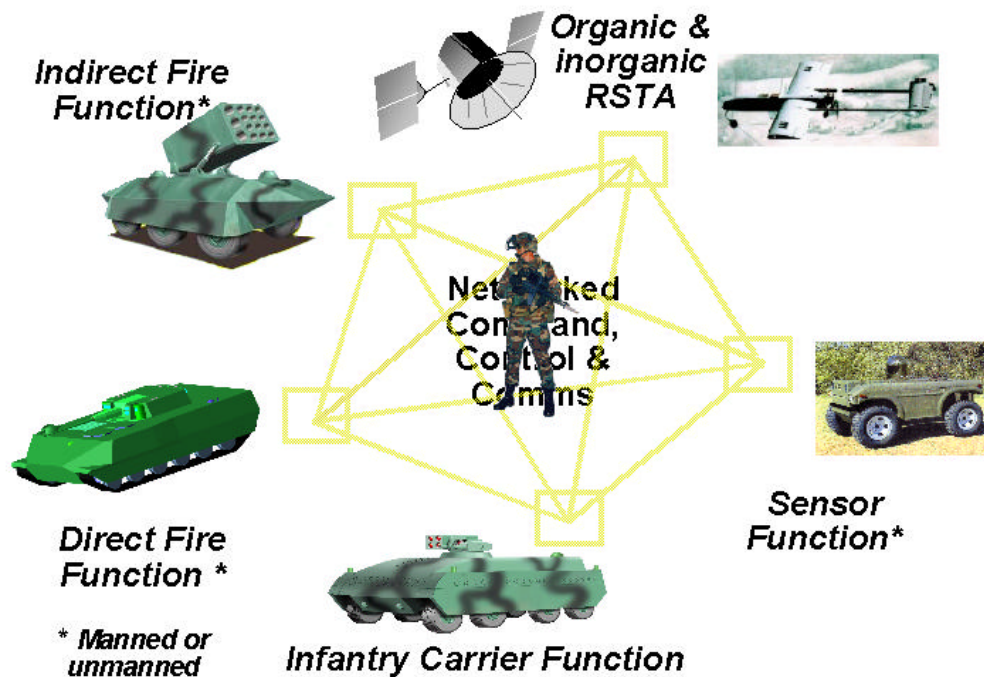
Objective Force

LTG Paul J. Kern



Future Combat Systems... A Systems of Systems Approach

***Notional Systems Construct
... Not Platform Centric***



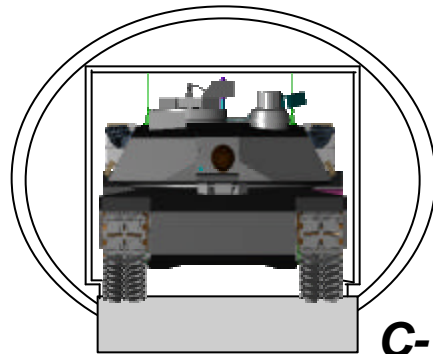
***DARPA / Army
Collaboration
...A \$2.7B Investment***

- DARPA: high risk & innovative approaches***
- Army: accelerates high-payoff core technologies***

Overwhelming Organizational Combat Power

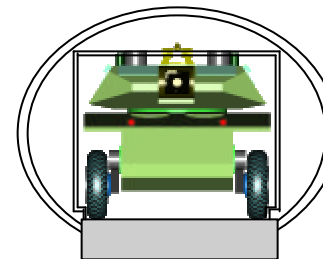
FCS Requires Operational and Technology Innovation

- ***Strategically/Tactically Mobile***
- ***Command and Control on the move***
- ***Lethality***
- ***Survivability***



***Fit the C-130
"Crucible"***

***Science
&
Technology***



***Up to:
70% Lighter
50% Smaller***

C-17/C-5

C-130

Current System

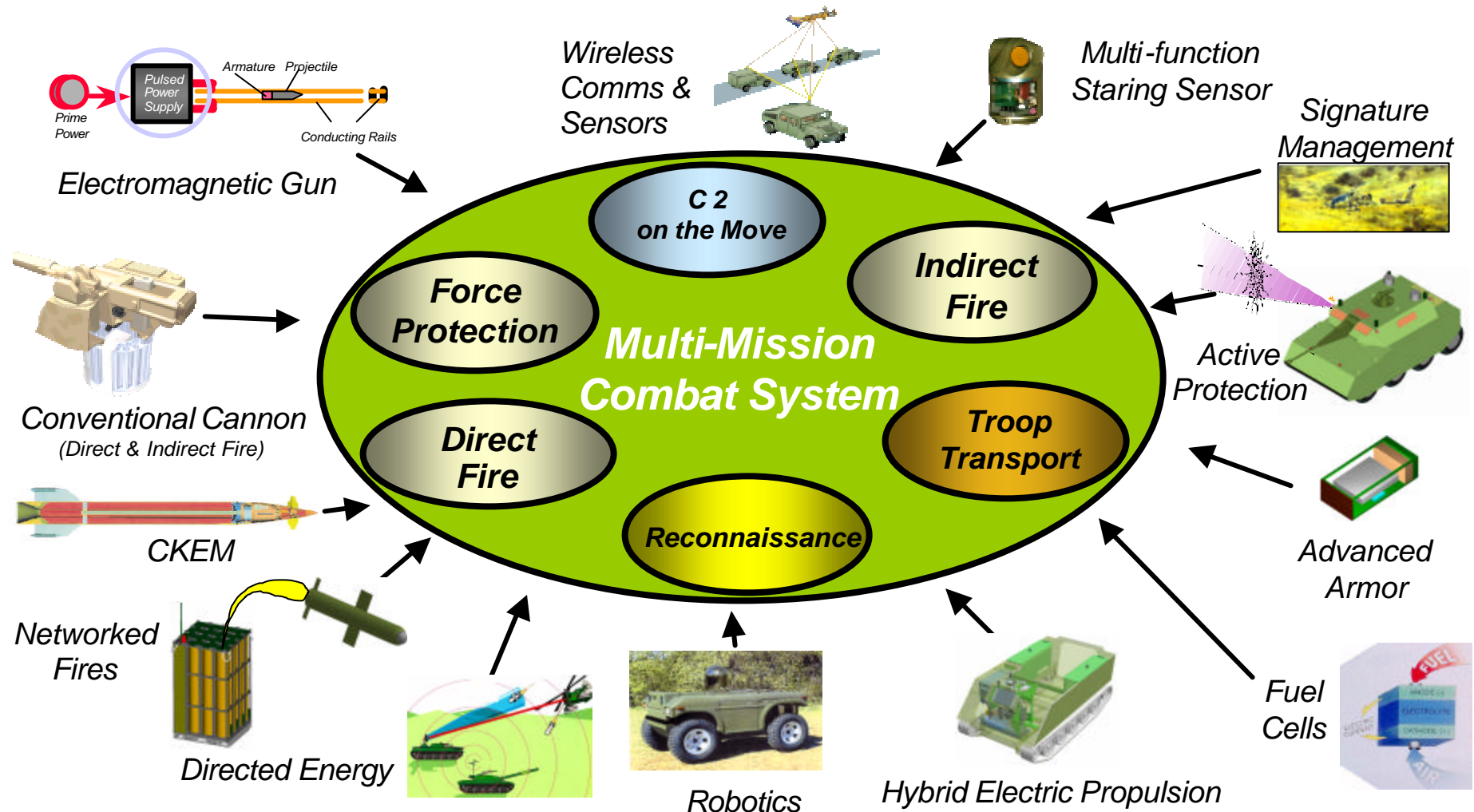
- ***70 tons***
- ***650 Cubic Feet Internal Volume***
- ***36 tons (51%) for structure & protection***

Future Combat Systems

- ***< 20 tons***
- ***300-400 Cubic Feet Internal Volume***
- ***< 9 tons (~45%) for structure and protection***

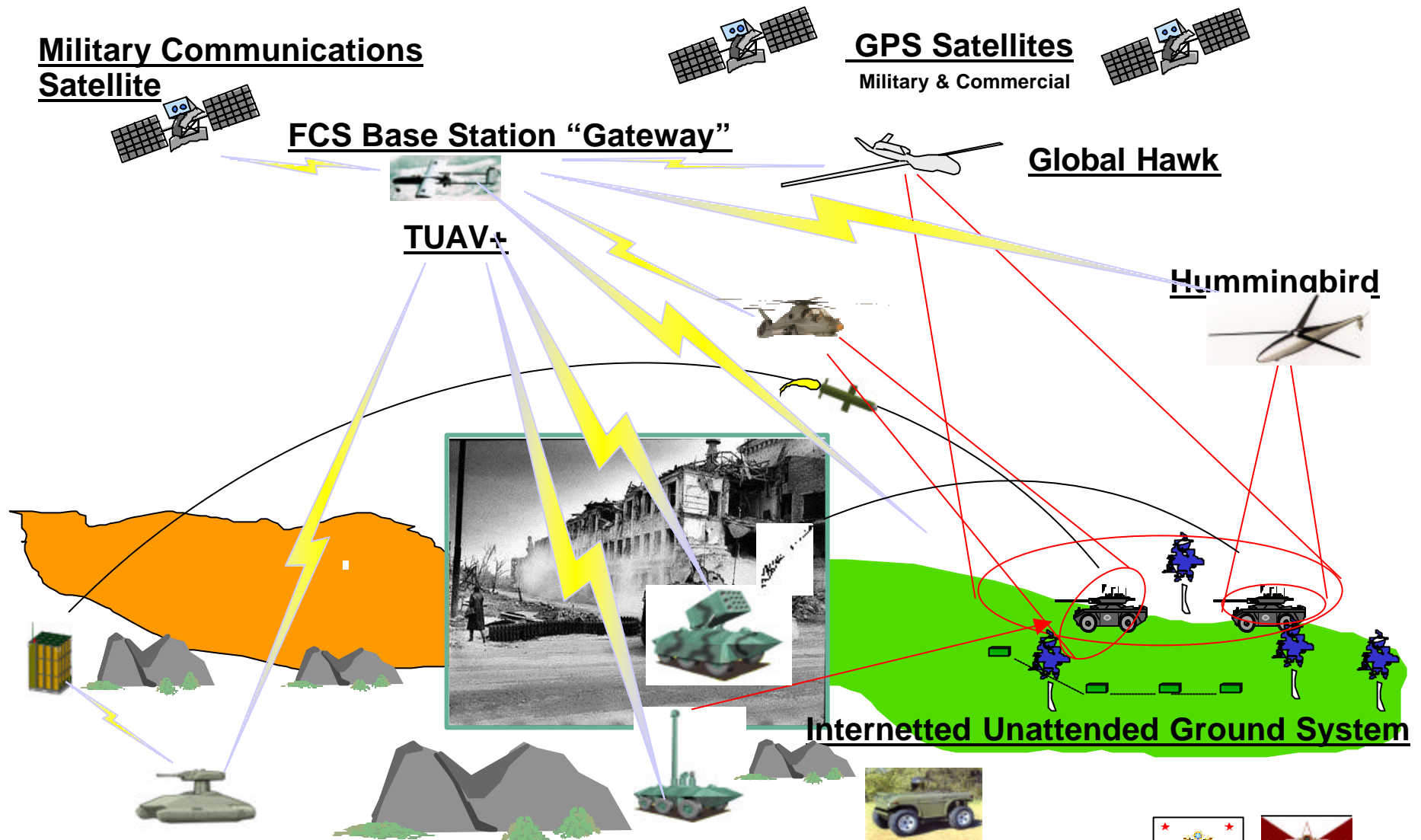


Develop Full Range of Technology Options for FCS



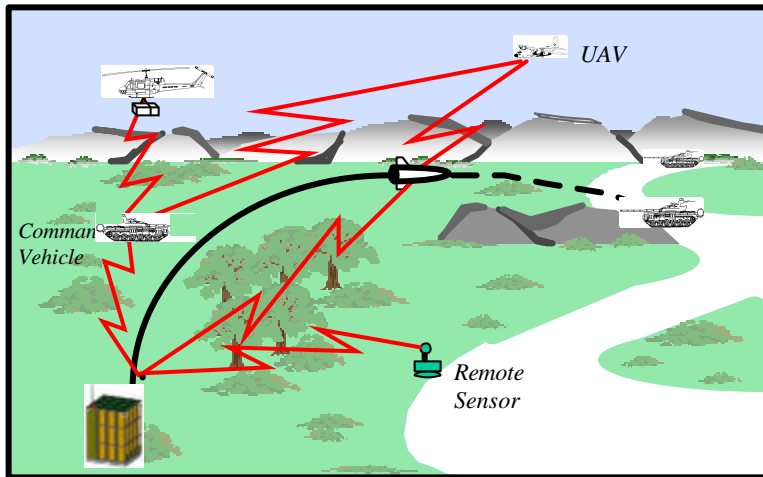
Focus on High Payoff Solutions for Technology Readiness Decision

Lethality and Survivability through... Network Centric Combat



Lethality Through...

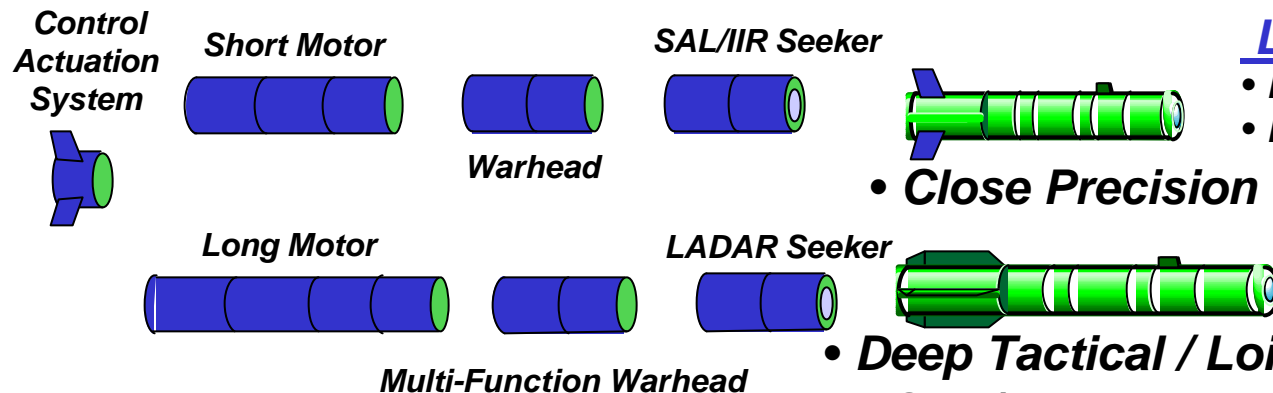
Beyond Line-of-Sight Networked Fires



Pacing Technologies:

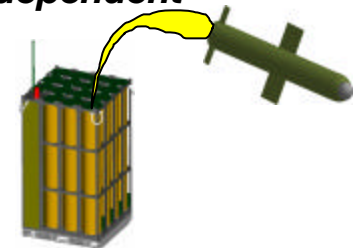
- **Sensors**
 - Uncooled Infrared (Precision Endgame)
 - 3-Dimensional Laser Radar RSTA/ATR
- **Guidance and Control**
 - Precision Miniature Inertial Guidance
 - Networked 2-Way Data Link
- **Container**
 - Plug-n-Fight (Data and Power)
 - Rocket Motor Gas Management
- **Propulsion**
 - Solid Pintle (Variable Thrust)
 - Miniature Turbojet (Loiter)

Common Modular Missile for Multi-Mission Capability

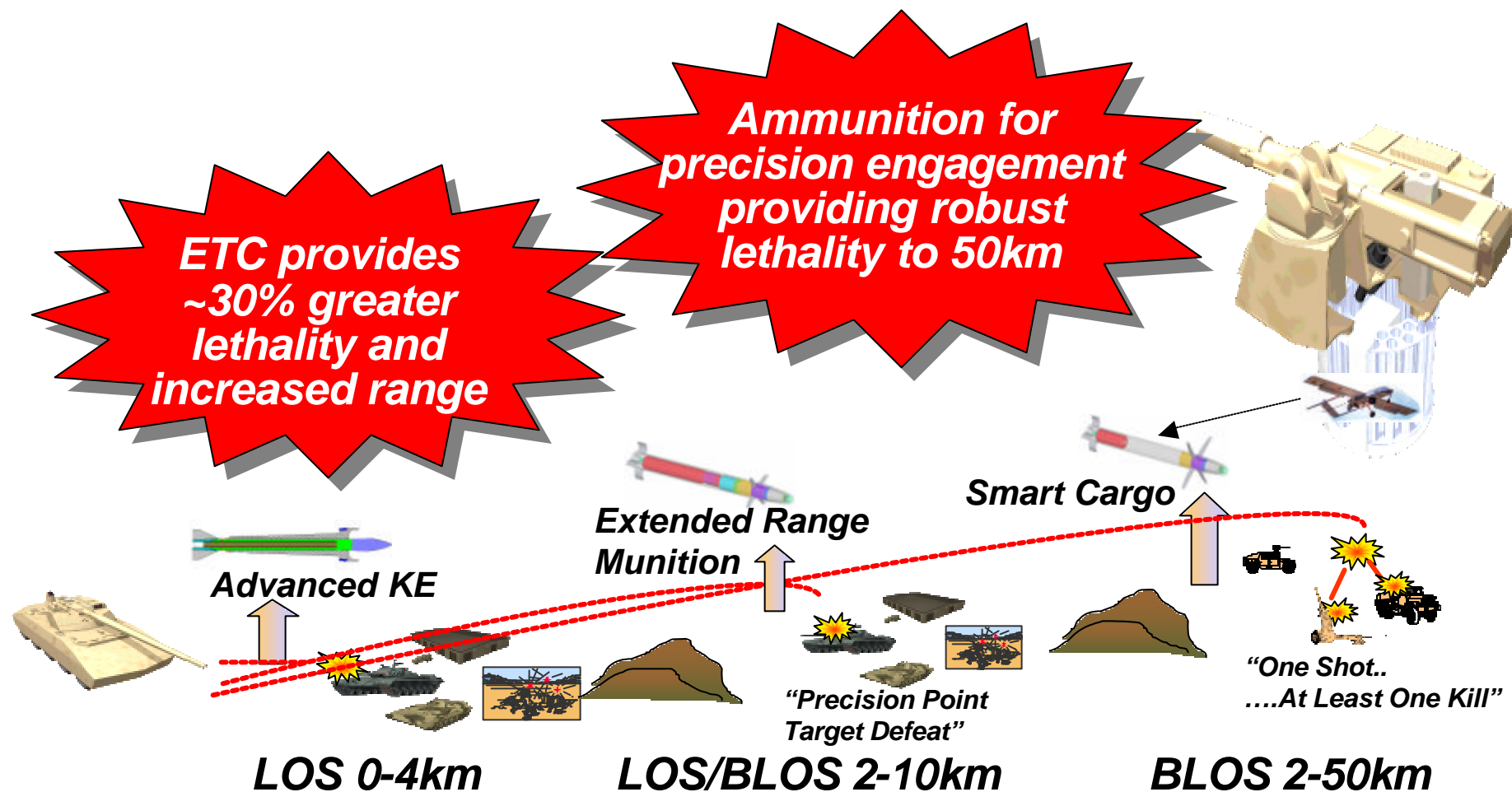


Containerized for Lower Life Cycle Costs

- Reduced Logistics
- Platform Independent
- **Close Precision**
- **Deep Tactical / Loiter**
- **RSTA/Damage Assessment**



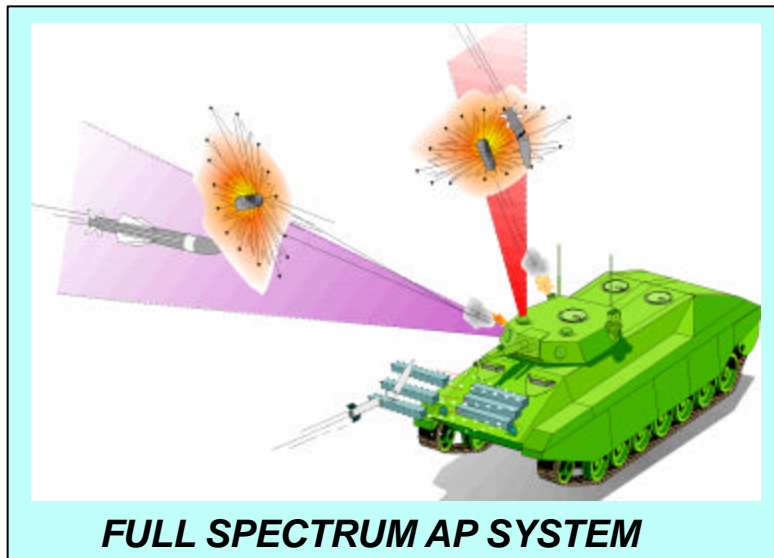
Lethality through... Multi-Role Armament System



Direct and Indirect Fire from one platform

Survivability through....

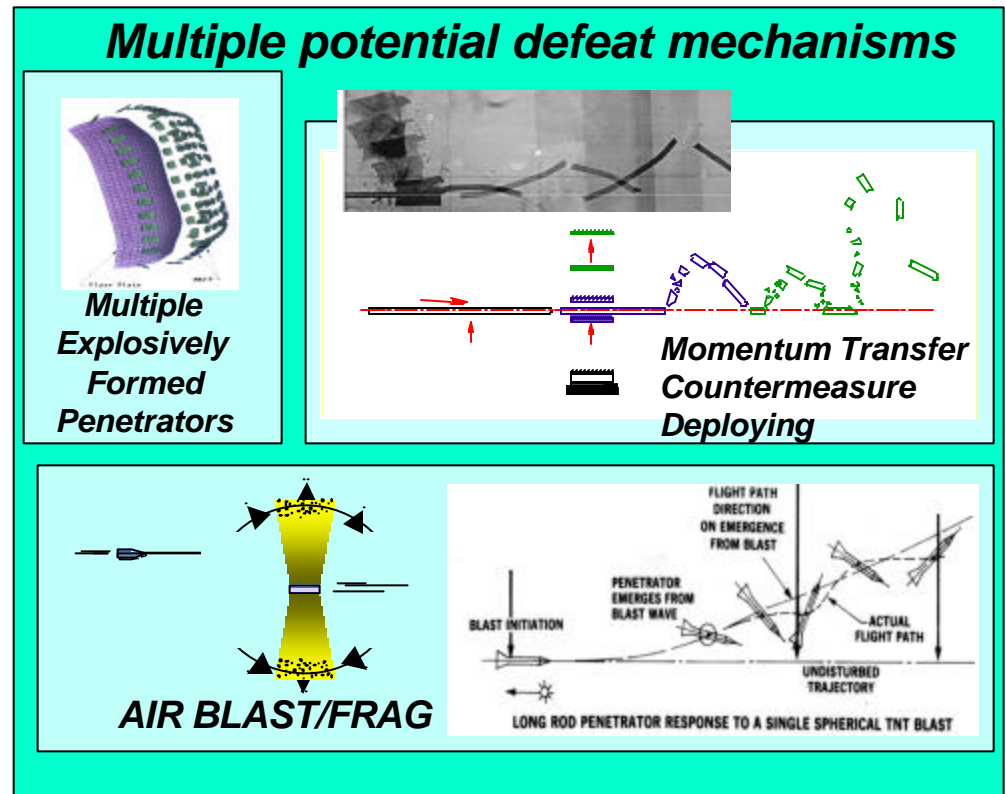
Full Spectrum Active Protection



Search-and-track dual frequency radar...
Millimeter Wave Integrated Circuit (MMIC) technology



High speed launcher... electronically-actuated, stabilized gimbals



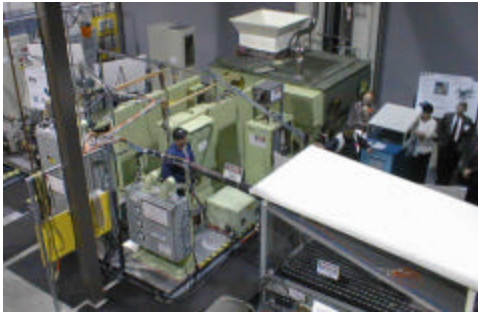
Defeat of Chemical Energy (CE) & Kinetic Energy (KE) threats



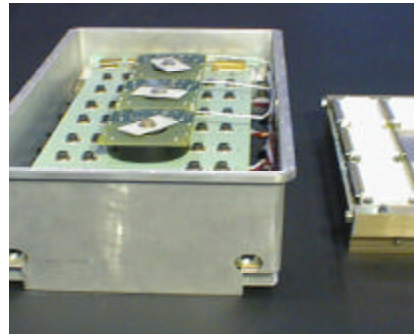
Mobility through....

Combat Hybrid Power System

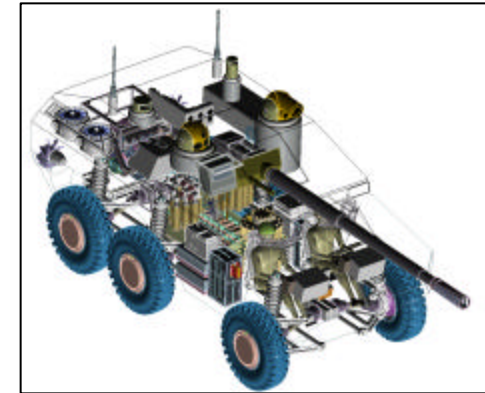
Objective: Demonstrate integrated hybrid electric power and propulsion system for a 20 ton combat vehicle.



**System Integration
Laboratory (SIL)**



Technology



Virtual Prototype

Pacing Technologies:

- Hybrid System Architecture
- Control Strategies for Power Management
- High Power and Energy Density Components - *Batteries, Capacitors, Converters, Flywheels*

Warfighter Payoffs:

- Improved mobility, survivability, lethality
- Reduced logistic footprint and increased sustainability
- Rapid deployability
- Reduced Logistics Burden

Compact, Fuel Efficient Power for FCS

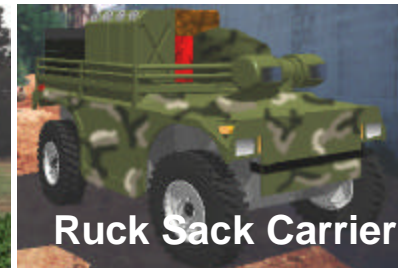


Reducing Soldiers' Risk Through... Controlled Autonomous Robotic Systems

Today...



FCS...



Technologies contributing to increasing performance:

- ***Machine vision algorithms***
- ***High resolution sensors and sensor fusion algorithms***
- ***Advanced commercial processors***



ASB Technology Assessment

(Can We Get There By 2010?)

OPERATIONS	
Robotic Vehicles	
Follower	GREEN
Semi-Autonomous	YELLOW
Autonomous	RED
Fires	GREEN
FTR	YELLOW
Lethality	
Gun	GREEN
Missiles	GREEN
EML	RED
DEW	YELLOW
Networking	GREEN

C4ISR	
Sensors(EO/IR, Radar)	GREEN
Sensor Fusion	YELLOW
Automated Target	YELLOW
UAV (FW or VTOL)	
Long Endurance	GREEN
Short Endurance	GREEN
Mini/Micro	YELLOW
Network Building Blocks	GREEN
Communications	GREEN
Battle Management	GREEN

SUSTAINMENT	
Logistics	GREEN
Supply Chain	GREEN
Hybrid Electric	
Diesel	GREEN
Fuel Cell	YELLOW
H2O from	YELLOW
High Reliability	GREEN
Tactical Air Lift --	
SSTOL	YELLOW
FTR	YELLOW

TRAINING	
Embedded Training	GREEN
Networked Training	YELLOW
Wireless Networked Training	YELLOW
Emulation	RED
Full Mission Rehearsal	YELLOW

Available < 2006	16 of 32	50%	including "Pacing Technologies"
Available 2010 - 2015	13 of 32	41%	
Not available until >2015	3 of 32	9%	

Source: ASB Assessment – June 2000



Summary

- *FCS is The Army's First Priority*
- *S&T is Creating Technology for the Future*

We Will Do Things We Have Never Done Before

- *FCS Will Create Full Spectrum Capability for a Strategically Responsive Force*

Army S&T... Accelerating the pace of Transformation

